

**AMERICAN
TRUCKING
ASSOCIATIONS**

2200 Mill Road, Alexandria, VA 22314-4677



POLICY DIVISION

ENGINEERING DEPARTMENT
(703) 838-1842

QA 19037

FHWA-97-2234-62
May 31, 1990

Federal Highway Administration
Docket Room 4232
400 Seventh Street, S.W.
Washington, DC 20590

RE: Docket No. 87-5 and 89-12, RIN 2125-AC 30, "Truck Length
and Width Exclusive Devices; Advance Notice of Proposed
Rulemaking."

Dear Sirs:

Enclosed for filing is a duly signed original and three
copies of the comments of American Trucking Associations, (ATA)
in the above-reference proceeding.

Please date and stamp the enclosed copy of this letter to be
returned to ATA as evidence of the filing of these comments.

Sincerely,

Larry W. Strawhorn
Director, Engineering Department

LWS:amt

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LEADS/REGS. DIV.

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Before the
**FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION**

JUNE 1, 1990
WASHINGTON, DC

Comments of
AMERICAN TRUCKING ASSOCIATIONS, INC.
On
**TRUCK LENGTH AND WIDTH EXCLUSIVE DEVICES;
ADVANCE NOTICE OF PROPOSED RULEMAKING**

DOCKET 89-12-59

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Docket No. 87-5 and 89-12
RIN 2125-AC 30
Federal Register [54 Fed. Reg. 52951]



Foreword

The American Trucking Associations, (ATA), located at 2200 Mill Road, Alexandria, Virginia 22314-4677, is a federation with affiliated associations in every state and the District of Columbia. In the aggregate, ATA represents every type and class of motor carrier in the country, for-hire and private. As the national representative of the trucking industry, ATA is vitally interested in any regulation affecting the operation of equipment utilized in the nation's trucking fleet.

ATA's comments here to FHWA Docket No. 87-5 and 89-12, were prepared by the staff of ATA's Engineering Department, which is responsible for handling issues dealing with the construction, use, and repairs of trucks and their components. For many years the Department has developed ATA's major position papers, docket submissions, and testimony relating to truck design. Among these were several submissions addressing the determination of vehicle dimensions. The Department and its staff are, therefore, well qualified to comment on the subject of this docket.

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Along with the work of the ATA Engineering Department staff, these comments also reflect guidance and technical input from ATA's Technical Advisory Group (TAG). TAG members are motor carrier maintenance, safety, research and development executives, balanced both geographically and by types of fleets, thereby representing a broad spectrum of vehicle users who will impacted by equipment regulations. Considering both its own expertise and the input from TAG, the ATA Engineering Department is well qualified to comment on the subject at hand.

Issue Manager: Larry W. Strawhorn
Director, Engineering Department
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INTRODUCTION

ATA takes this opportunity to comment on Docket No. 87-5 and 89-12, "Length and Width Exclusive Devices".

These comments will cover the loss of productivity in the trucking industry due to lack of consideration of the tolerances inherent in the manufacture and measurement of trailers; and will respond to the specific questions raised by FHWA in the docket.

In addition recommendations are included for requiring manufacturers to self-certify the dimensions of their vehicles; and for an advisory committee to consider requests for exemption from length and width measurement.

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DISCUSSION

In docket 87-5 and 89-12 FHWA is proposing to simplify administration of the STAA provisions allowing certain devices to be excluded when a vehicle is measured for compliance with federal length and width limits. The FHWA proposes to exclude from length and width measurement all devices that extend no more than three inches beyond the structural components of the vehicle. For trailers and semitrailers, the components to be included in the measurements are the structural elements of the floor, walls or top, including stiffeners and fasteners and all load carrying elements.

Manufacturing Tolerances

The trouble with this simplification is that it does not recognize that manufacturing tolerances, expansion and contraction of construction materials due to temperature and expansion and contraction of measuring devices themselves are inherent characteristics of manufacture, operation and measurement. This denial of reality will force trailer manufacturers to build to the minus side of the tolerance band. For example, knowing that there are a number of tolerances that cumulatively can exceed 2", trailer manufacturers will build trailers 2"-4" narrower to ensure that they are strictly within the 102.36" width limit. (The situation is more critical with

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width than it is with length, thus our discussion will be limited to width). That is, if they build a 98" wide trailer and manufacturing tolerances extend it 4", then they can be sure their trailers will be within the 102". Figure 1 indicates that in practical terms this could mean the loss of a row of pallets. The consequences of this are discussed in detail further on.

As another example, if a trailer manufacturer knows high temperatures will cause trailer width to expand 1", the trailer will be built to be 101" wide when "cold". Building trailers this way will also reduce internal width.

This proposal would have been acceptable if it had excluded components in the walls, floor, and top which only serve to reinforce the trailer structure. This would include bolt and rivet heads, hinges and sections used to stiffen the primary trailer members. The way to do this is have trailer manufacturers affix a certification label stating that the trailer or semitrailer was manufactured to be 102 inches by 48 feet etc., excluding stiffeners and hardware. Then the enforcement problem becomes one of measuring load induced bulges, which should fall into the 3 inch blanket allowance.

Sources of Error in Measurement

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Measuring trucks and trailers is an imprecise art requiring judgment. Trucking equipment in the field is not checked for

compliance with a micrometer under laboratory conditions. Error is inherent in the process due to such things as expansion, measurement technique and instrument error.

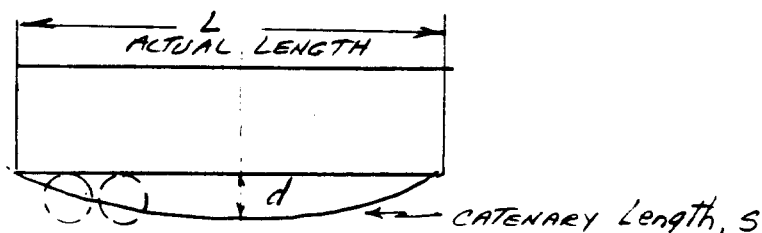
A 48 foot long, 102 inch wide trailer grows and shrinks due to temperature. A 60°F change in ambient conditions can cause a change of 3/32 inch in trailer width and 1/2 inch in length.

It is impossible to pull the steel tape, used to measure a 48 foot long trailer, perfectly straight. The measuring device will sag in the middle and assume the shape of a catenary.

Using the following formula:

$$S = L \left[1 + \frac{2}{3} \left(\frac{2d^2}{L} \right) \right]$$

where S=catenary length
L=straight length between ends of catenary
d=sag in center of catenary



When the horizontal length between two points is 48 feet a catenary between those points will be:

- 3/16 inches longer, if it sags 6 inches below horizontal at center
- 11/16 inches longer, if it sags 12 inches below horizontal at center.
- 2 11/16 inches longer, if it sags 24 inches below horizontal at center.

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That is, a 48' trailer can be anywhere from 3/16" or more "over length" due to inability to pull the measuring tape perfectly straight.

But the tape itself is subject to variation. The U.S. Bureau of Standards, in their Handbook 44, establishes the tolerance applicable with respect to the accuracy of linear measures. That Handbook gives the following for the type of tape measures typically used to measure trucks:

"T.2. FOR METAL TAPES. - Maintenance and acceptance tolerances in excess and in deficiency for metal tapes shall be as shown in table 2, tapes of 25 feet and over being at a tension of 10 pounds, tapes of less than 25 feet being at a tension of 5 pounds, and all tapes being supported throughout on a horizontal flat surface.

TABLE 2. - MAINTENANCE AND ACCEPTANCE TOLERANCES, IN EXCESS AND IN DEFICIENCY, FOR METAL TAPES.

Nominal interval from zero		Tolerance
Feet		Inch
6 or less -----		1/32
7 to 30, incl-----		1/16
31 to 55, incl-----		1/8
56 to 80, incl-----		3/16
81 to 100, incl-----		1/4"

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If these variations are added to the inability to keep the tape perfectly straight then it can be seen that a perfectly built 102.36" wide trailer, 48' long, could measure $102.36 + 1/16"$ (ignoring sag of the tape); and $48' + 3/16 + 1/8 = 48' + 5/16"$; not including expansion due to temperature noted previously

In the face of the many factors which preclude precise measurements, such as those just discussed, one wonders how important it is to include rivet heads, hinges and rub rails in overall trailer measurements. Certainly their contribution to overall size is not much, if any, greater than possible through measurement error. Figure 2 indicates the sources of error, or causes of measurement discrepancy and typical manufacturing tolerances. It shows that when all structural elements and measurement errors are added up they would be within the proposed 3" blanket exemption. The most extreme coverage would be caused by a door hinge, taking up 3 inches.

Self Certification

If manufacturers certified that their trailers were built to a 102 inch standard, excluding stiffeners and hardware, then the inspectors would know that widest a "102 inch" trailer could be would be $102" + 6$ inches. This incremental increase would be within the 3" blanket exemption, yet would not allow more cubic capacity than trailers have today. It would allow traditional

repairs to cracked lower frame rails (fish plates) and reinforcements used when trailers are lengthened. It would eliminate time consuming measurement at weigh stations. Figure 3 shows the simple situation resulting from our proposal.

By disregarding structural members enforcement personnel could concentrate on determining if the bulges in trailer sides due to load settling, or any other devices and characteristics deriving from "safely and efficiently" hauling freight, exceeded the 3 inch limit.

Loss in Productivity

There are serious productivity consequences from failing to account for manufacturing tolerances. The FHWA proposal as published would cause manufacturers to build to 102 inches minus the tolerance, resulting in trailers that could lose 4 inches or more in internal width. An analysis of the price to be paid if this 4 inches is lost is attached. It indicates that the revenue loss could be as high as 3.9 billion dollars plus increased emissions and highway congestion.

The part of the trucking industry which uses 48" pallets faces the loss of a row pallets, or conversion to another pallet standard. This cost has not been calculated, but again, would be extremely costly both in terms of lost revenue and conversion to a smaller size standard for pallets.

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Proposed Advisory Committee

We do not believe there is any way to simplify the present process. There will always be new devices appearing in the marketplace, and there will always be honest differences in interpretation over whether they contribute to "safely and efficiently" moving freight. In the interest of addressing the more fundamental issues before it, the FHWA may find it effective to seek the recommendations of an Advisory Committee regarding exclusions of future devices. Where there are problems with determining the effect of these future exclusions modest studies or tests could be performed. It might be that the burden of proof should rest on the proponents of future exclusions - to convince the Advisory Committee of the efficacy of their device.

Possible members of such a committee would be representatives of carriers, state highway authorities vehicle manufacturers and shippers. The committee would deal on a case by case basis with those occasional incidents when a notice of Interpretation (NOI) is requested, and the Committees recommendations would form the basis of the NOI.

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ANSWERS TO QUESTIONS

1. What are the safety and enforcement implications of (1) requiring that certain categories of vehicle components be included in a length or width measurement and (2) allowing a blanket exclusion for other devices extending no more than 3 inches beyond the outer dimensions of the components that must be included in length and width measurements?

We don't believe there are any safety implications in the width issue. We are not aware of any studies that indicate accidents as a function of vehicle width (e.g. increase in accidents per 1" increase in vehicle width). The U.S. DOT, in their final report, "An Investigation of Truck Size and Weight Limits," August 1981, page S-3 noted:

"There is a great deal of concern regarding the safety performance of large trucks... However, the data that can be used to address this issue are inconclusive regarding the effects of truck size and weights...other studies show no significant difference in the safety performance of larger combination trucks. If this is correct, increases in size and weight limits would result in decreases in accident frequency since fewer truck trips would be required to transport the Nation's freight."

Enforcement implications would be substantially reduced by our proposal since inspectors would be concerned only with the gross overall dimensions and not have to consider what device protrudes beyond the trailer structure, as long as it is in the 3" allowance.

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2. What other alternatives are there for simplifying the present process for determining which devices should be included or excluded when measuring the length or width of a vehicle?

We do not believe there is any way to simplify the present process. It may be easier if a committee were established to consider candidates for exemption, but action will still be needed on a case by case basis.

3. The following are possible categories for components of trailers: (1) Structural (needed to support or convey the load), (2) load protection, (3) protection of trailer components, and (4) vehicle safety. Are there any other categories that would be useful for determining whether a device should be included or excluded from a length or width measurement?

Without a prediction of future technological developments we don't believe categories can be anticipated. Stipulating categories will only lead to debates over semantics.

4. How would the proposed approach or an approach offered in response to question number 2 impact:

Vehicle manufacturers?
Motor carriers?
Shippers?
Highway operations?

It would be the same as it is now.

5. Under existing Federal regulations, States must exempt specified devices from the measurement of vehicle length and width. They may exempt safety devices that do not extend more than 3 inches from the side of a vehicle. Does the problem of determining what new devices should be exempted from length and width measurements warrant further preemption of State authority by requiring them to allow a blanket 3 inch exemption?

The blanket 3 inch exemption is a good thing. The issue should not be one of preemption, but rather one of ease of enforcement, uniformity and flexibility.

6. Current regulations provide that the length of a semitrailer and a full trailer is to be measured from the front vertical plane of the foremost transverse load carrying structure to the rear vertical plane of the rearmost transverse load carrying structure. Current regulations also provide that the width of a trailer is measured across the sidemost load carrying structures, support members, and structural fasteners. Should these regulations be clarified and if so, how?

If the proposal to require manufacturers to self-certify "as-built" dimensions is adopted, then this is not an issue.

7. There are no regulations on how buses or other commercial vehicles are to be measured. Are they needed? If so, how should they read?

If the manufacturers are required to self-certify dimensions then this is not an issue for these vehicles, and is an especially easy case because there should not be too many cases of load induced bulges (and none in the case of buses).

8. Should there be a limit on how far a width exclusive device may extend, if more than 3 inches, from the side of a vehicle (i.e., rearview mirrors, turn signal lamps, handholds for cab entry and egress, and splash and spray suppressant devices)? If so, what should the limit be?

The easy way out of this bind is to adopt the proposal for a committee to consider candidates for exemption and let them decide. They can determine, either by literature search or new studies, the safety impact of future width exclusive devices.

9. Are there any devices on trailers manufactured between 1983 and 1987 that would be eliminated by the proposed regulations? If so, what are they? Should they be "grandfathered?" What should the "grandfather" date be?

Trailers built before the proposed self certification scheme becomes effective should be grandfathered.

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Conclusions

1. There does not appear to be a way to simplify the present process. Given all the current and future fittings and devices that could be candidates for exclusion it seems impossible to fashion an all encompassing rule or a streamlined process. The suggestion to establish an advisory committee while not simplifying the process, may make it less onerous for the FHWA.
2. The blanket 3" exemption is a reasonable figure and ATA agrees with the part of the proposal to establish a blanket 3" exemption. A check of maximum potential width from buildup of manufacturing and measuring tolerances indicates 3" is a realistic value.

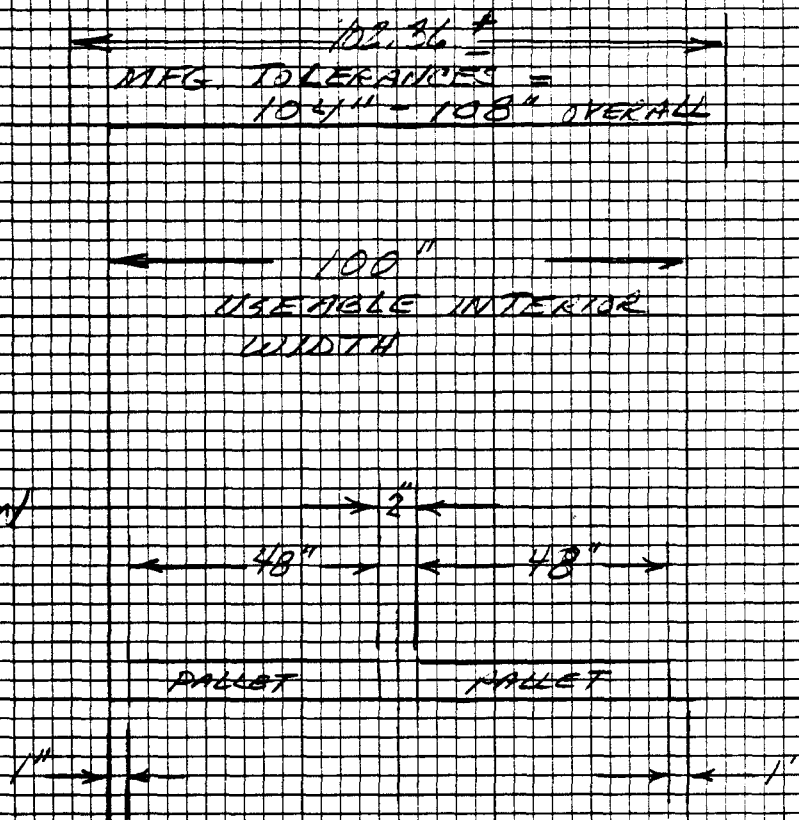
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Recommendations

1. FHWA work with the NHTSA to require vehicle manufacturers to self-certify vehicle dimensions.
2. FHWA establish a committee to advise FHWA, on a case by case basis, on devices and components that should be excluded from length and width measurements.
3. Assuming a self-certification process is mandated, vehicles manufactured before the effective date of the mandate should be grandfathered.

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PRESENT
SITUATION



POSSIBLE
FUTURE
SITUATION

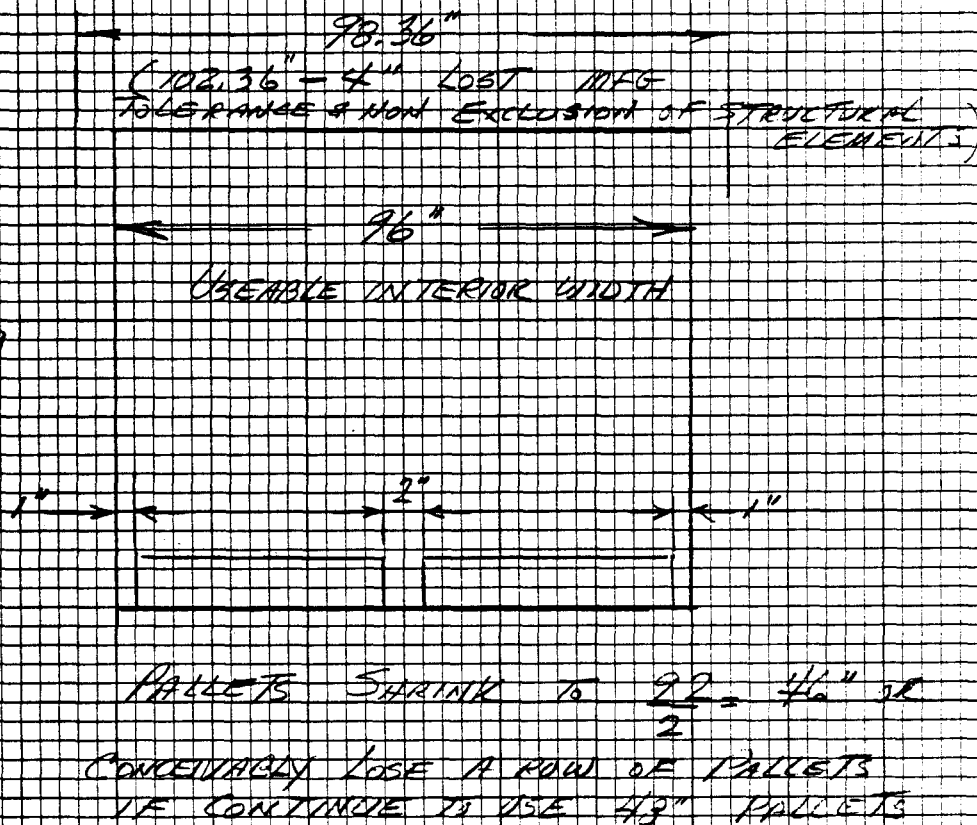
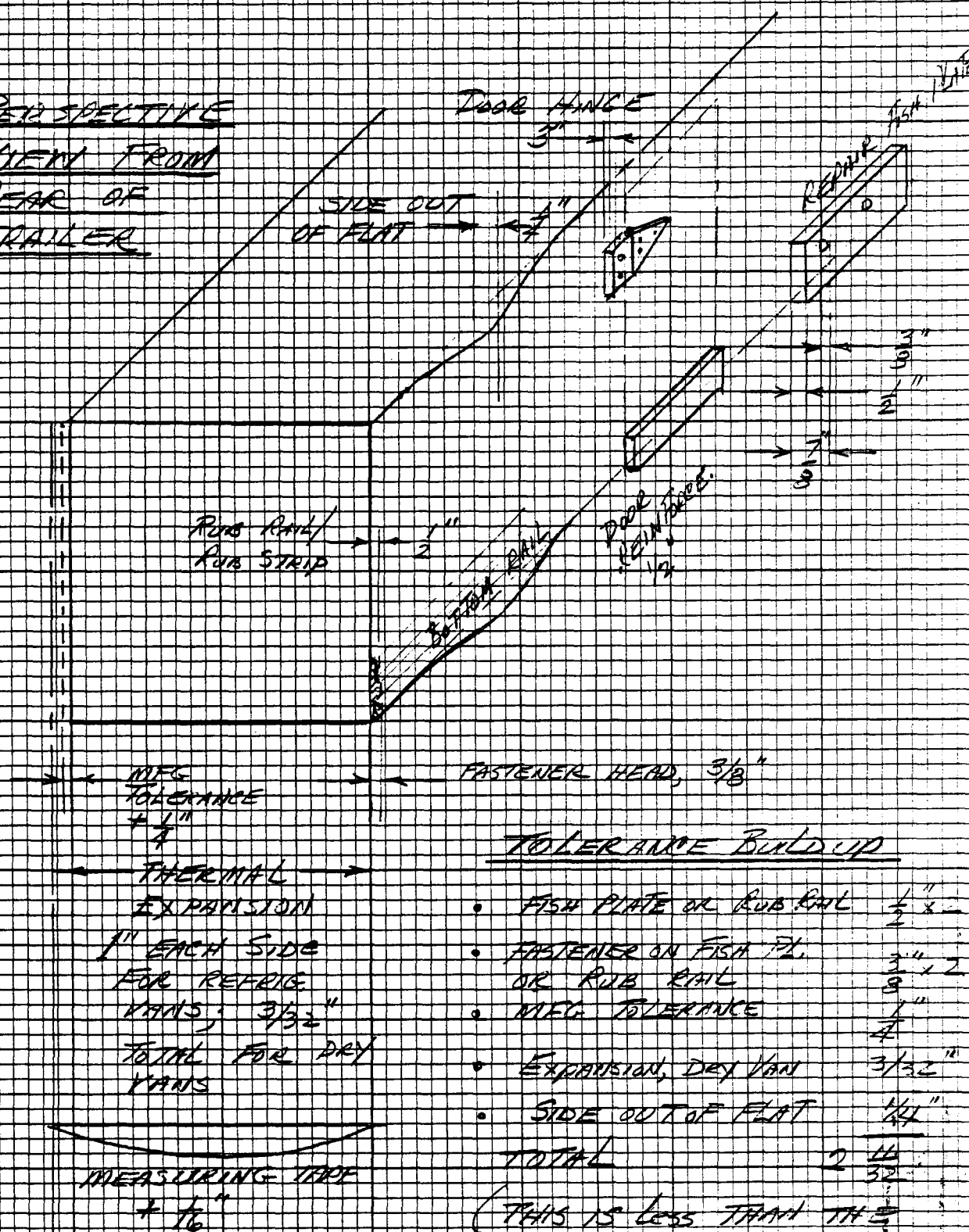


FIG. 1

PERSPECTIVE
VIEW FROM
REAR OF
TRAILER



ALLOWED WIDTH
PER PROPOSAL
= 108.36"

TOLERANCE BUILD UP

- | | |
|---------------------------------------|-----------------------------------|
| • FISH PLATE OR RUB RAIL | $\frac{1}{2}$ " |
| • FASTENER ON FISH PL.
OR RUB RAIL | $\frac{3}{8}$ " |
| • MFG. TOLERANCE | $\frac{1}{4}$ " |
| • EXPANSION, DRY VAN | $3/32$ " |
| • SIDE OUT OF FLAT | $\frac{1}{4}$ " |
| <u>TOTAL</u> | <u>$\frac{11}{32}$</u> |

(THIS IS LESS THAN THE
3" due to DOCK HINGE)

$$102.36 + 2.34 = 104.7''$$

FOR REFRIG. VAN TOTAL 15

$$107.36 + 4.34 = 106.34$$

FIG. 2

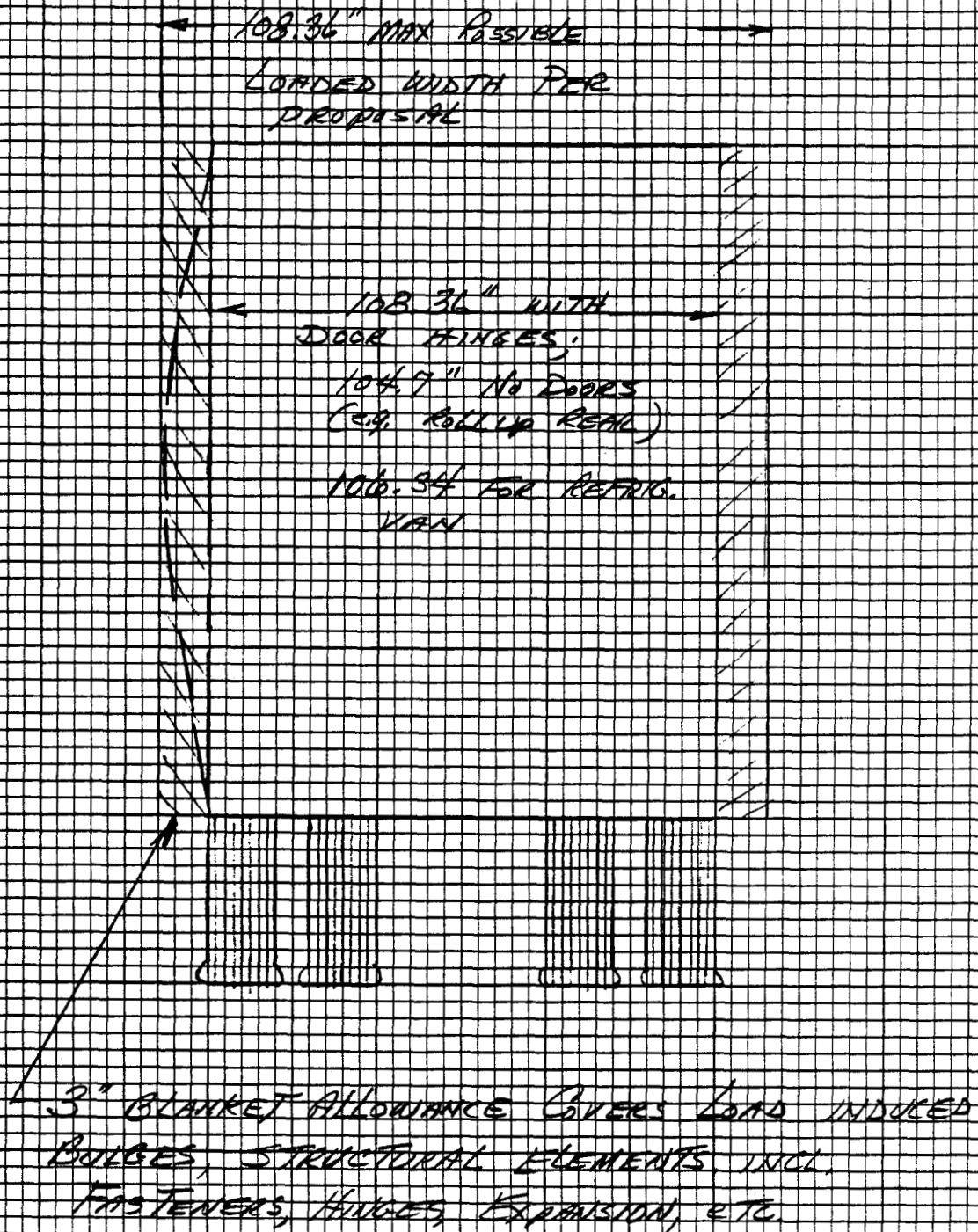


FIG. 3.

ATTACHMENT

DRAFT

PRELIMINARY ESTIMATE OF
ECONOMIC IMPACT OF
DECREASED TRAILER DIMENSIONS

Introduction

Estimating the economic impact on motor carriers of changes in operating procedures or regulations is a difficult thing to do because the industry is so varied, and the rates charged also vary.

However, some analytical estimates can be made based on general knowledge of the industry.

Two cases will be discussed. The first involves "floor loads" where the freight is loaded onto the floor of a van trailer. Typical commodities are processed and unprocessed foods, such as sacks of grains and sugar, crates of fresh vegetables and fruits, and cartons of bottled foods.

The second case is palletized loads - where the commodity is loaded on pallets which are then stacked into the trailer by fork lift truck (most processed foods can be loaded on pallets also). Durable goods is an example of items loaded on pallets.

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In both cases the following assumptions are made:

1. The trailer is a 48' van, 9' inside height, nominal 102" wide.
2. Four inches of internal width is lost.
3. Payload weight is 40,000 lbs.
4. The tractor-trailer combination carries 120 loads annually.
5. The 40,000 lb. payload weight (fully loaded trailer) is achieved only 50% of the time.
6. The tractor travels 100,000 miles annually.
7. 500,000 tractors are involved. (only those pulling van trailers)
8. The freight rate is \$2.50/hundred weight (\$.025/lb.).
9. Fuel consumption is 6 mpg.
10. The payload density is 40 lbs./cubic ft.

Analysis-Case 1

Losing 4 inches width means that for floor loads, a strip 4 inches (0.33 ft.) x 48 ft. x 9 ft. is lost. This is 144 cu. ft. x 40 lb./cu. ft. = 5760# of payload lost per load.

This approximately 5700 lbs. represents $5700 \times \$0.025/\text{lb.} = \132.50 loss in revenue per load. Over 120 loads this loss is $120 \times \$132.50 = \$15,900$ annually. However, since we assume the van will be fully loaded only 50% of the time (when empty the loss of interior space is irrelevant) the annual cost is \$7,950 per trailer - hence per tractor-trailer combination.

Assuming 500,000 tractor trailer combinations the industry wide loss of revenue would be \$3,950,000,000.

Fleets can raise rates to compensate for this loss, or buy additional vehicles to take up the slack. If the payload is 40,000# the 5,760# loss represents approximately 14% of the original payload. Assuming the 50% -of-the-time-fully-loaded factor perhaps 7% of the payload, in terms of weight, is lost across the nation annually. We cannot estimate how many fleets will raise rates as opposed to those that will purchase additional equipment, nor how much additional equipment they will buy. But if we assume a 7% loss in payload requires a 7% increase in the number of vehicles, then this 7% increase in a 500,000 vehicle base means an additional 35,000 vehicles - mainly trailers, will have to be purchased, at a cost of 35,000 @ \$14,000 = \$490,000,000.

These additional trailers will have to be pulled by tractors, either additional ones, or existing ones by increasing their mileage substantially. Say 20,000 tractors running 100,000 miles annually @ 6 mpg: This is an additional 330,000,000 gallons of fuel burned unnecessarily each year. These 20,000 tractors would pump 266,000,000 lbs. of emissions into the air each year in areas of the country which are already severely polluted. In addition, when the nation is contemplating spending millions of dollars to create means for reducing gridlock, it would appear that adding vehicles is contrary to good sense. All this

notwithstanding it is a fact that a given amount of freight has to be carried in this country and it will have to be done either in a few, larger vehicles, or many smaller ones.

Whether fleets raise rates or buy additional equipment, the costs to the nation will be substantial.

The maintenance on these additional 35,000 trailers at \$.03 per mile would be an additional cost of $35,000 \times 0.03 \times 100,000$ miles = \$105,000,000 annually.

Case 2 Palletized loads

It is especially difficult to estimate the impact of reduced interior dimensions in this case. Some fleets with pallets designed expressly for today's interior dimensions, could lose the ability to load two rows of 48" pallets, (2 forty eight inch pallets with 1" clearance on the sides, and 2" between the pallets require 100" interior width) or they would have to initiate manufacture of a new, smaller line of pallets. Industries which have designed their commodities expressly for the 48" pallet would face severe problems.

At worst, the number of trailers on the road carrying efficiently designed "packaging systems" for today's trailers would double. At best the impact would be similar to case 1.

Summary

From a general motor carrier industry perspective a conservative estimate of the economic impact is as follows:

1. Loss in revenue: \$3.9 billion annually

or

2. Cost of new equipment:

Initial cost of additional trailers \$490 million (one time)

Added maintenance \$105 million annually

Additional fuel \$330 million annually

and

3. Additional emissions.
4. Increased highway congestion

If, as others have estimated, the width reduction could be as much as 12", resulting in 90" interior width trailers, then the estimates above would be increased 50%. Thus the economic impact is in the billions of dollars with unmeasured additional cost due to increased air pollution and traffic congestion.

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